

SEQUENCE LISTING

<110> Suzano Papel E Cellulose S.A.
Fundacao De Estudos Agrarios "Luiz De Queiroz"- Fealq
Fundacao De Amaparo A Pesquisa Do Estado De Sao Paulo
Labate, Carlos Alberto
Labate, Monica Teresa Venesiano
Bertolo, Ana Leticia
Nascimento, Daniela Defavari
Gunta, Gutmanis
Maria, Faraldo Inez Fernandes

<120> METHOD FOR THE GENETIC MODULATION OF THE BIOSYNTHESIS OF
HEMICELLULOSES, CELLULOSE AND URONIC ACIDS IN PLANT CELLS USING
GENE EXPRESSION CASSETTES

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<140> US 10/586,875

<141> 2005-01-21

<160> 4

<170> PatentIn version 3.4

<210> 1

<211> 480

<212> PRT

<213> Glycine max

<400> 1

Met Val Lys Ile Cys Cys Ile Gly Ala Gly Tyr Val Gly Gly Pro Thr
1 5 10 15

Met Ala Val Ile Ala Leu Lys Cys Pro Ser Ile Glu Val Ala Val Val
20 25 30

Asp Ile Ser Lys Ser Arg Ile Ala Ala Trp Asn Ser Asp Gln Leu Pro
35 40 45

Ile Tyr Glu Pro Gly Leu Asp Gly Val Val Lys Gln Cys Arg Gly Lys
50 55 60

Asn Leu Phe Phe Ser Thr Asp Val Glu Lys His Val Phe Glu Ala Asp
65 70 75 80

Ile Val Phe Val Ser Val Asn Thr Pro Thr Lys Thr Gln Gly Leu Gly
85 90 95

Ala Gly Lys Ala Ala Asp Leu Thr Tyr Trp Glu Ser Ala Ala Arg Met

100

105

110

Ile Ala Asp Val Ser Lys Ser Asp Lys Ile Val Val Glu Lys Ser Thr
 115 120 125

Val Pro Val Lys Thr Ala Glu Ala Ile Glu Lys Ile Leu Thr His Asn
 130 135 140

Ser Lys Gly Ile Lys Phe Gln Ile Leu Ser Asn Pro Glu Phe Leu Ala
 145 150 155 160

Glu Gly Thr Ala Ile Lys Asp Leu Phe Asn Pro Asp Arg Val Leu Ile
 165 170 175

Gly Gly Arg Glu Thr Pro Glu Gly Gln Lys Ala Ile Gln Thr Leu Lys
 180 185 190

Asp Val Tyr Ala Gln Trp Val Pro Glu Glu Arg Ile Leu Thr Thr Asn
 195 200 205

Leu Trp Ser Ala Glu Leu Ser Lys Leu Ala Ala Asn Ala Phe Leu Ala
 210 215 220

Gln Arg Ile Ser Ser Val Asn Ala Met Ser Ala Leu Cys Glu Ala Thr
 225 230 235 240

Gly Ala Asn Val Gln Gln Val Ser Tyr Ser Val Gly Thr Asp Ser Arg
 245 250 255

Ile Gly Pro Lys Phe Leu Asn Ala Ser Val Gly Phe Gly Gly Ser Cys
 260 265 270

Phe Gln Lys Asp Ile Leu Asn Leu Val Tyr Ile Cys Glu Cys Asn Gly
 275 280 285

Leu Pro Glu Val Ala Glu Tyr Trp Lys Gln Val Ile Lys Ile Asn Asp
 290 295 300

Tyr Gln Lys Ser Arg Phe Val Asn Arg Val Val Ala Ser Met Phe Asn
 305 310 315 320

Thr Val Ser Asn Lys Lys Ile Ala Ile Leu Gly Phe Ala Phe Lys Lys
 325 330 335

Asp Thr Gly Asp Thr Arg Glu Thr Pro Ala Ile Asp Val Cys Gln Gly
340 345 350

Leu Leu Gly Asp Lys Ala Asn Leu Ser Ile Tyr Asp Pro Gln Val Thr
355 360 365

Glu Asp Gln Ile Gln Arg Asp Leu Ser Met Asn Lys Phe Asp Trp Asp
370 375 380

His Pro Ile His Leu Gln Pro Thr Ser Pro Thr Thr Val Lys Lys Val
385 390 395 400

Ser Val Val Trp Asp Ala Tyr Glu Ala Thr Lys Asp Ala His Gly Leu
405 410 415

Cys Ile Leu Thr Glu Trp Asp Glu Phe Lys Thr Leu Asp Tyr Gln Lys
420 425 430

Ile Phe Asp Asn Met Gln Lys Pro Ala Phe Val Phe Asp Gly Arg Asn
435 440 445

Ile Val Asp Ala Asp Lys Leu Arg Glu Ile Gly Phe Ile Val Tyr Ser
450 455 460

Ile Gly Lys Pro Leu Asp Pro Trp Leu Lys Asp Met Pro Ala Val Ala
465 470 475 480

<210> 2

<211> 346

<212> PRT

<213> Pisum sativum

<400> 2

Met Ala Ala Asn Ser Ser Asn Gly Asp Asn Gln Lys Thr Ser Lys Gln
1 5 10 15

Pro Pro Leu Pro Ser Pro Leu Arg Phe Ser Lys Phe Phe Gln Ser Asn
20 25 30

Met Arg Ile Leu Val Thr Gly Gly Ala Gly Phe Ile Gly Ser His Leu
35 40 45

Val Asp Arg Leu Met Gln Asn Glu Lys Asn Glu Val Ile Val Ala Asp
50 55 60

Asn Tyr Phe Thr Gly Ser Lys Asp Asn Leu Lys Lys Trp Ile Gly His
65 70 75 80

Pro Arg Phe Glu Leu Ile Arg His Asp Val Thr Glu Pro Leu Met Ile
85 90 95

Glu Val Asp Gln Ile Tyr His Leu Ala Cys Pro Ala Ser Pro Ile Phe
100 105 110

Tyr Lys Tyr Asn Pro Val Lys Thr Ile Lys Thr Asn Val Ile Gly Thr
115 120 125

Leu Asn Met Leu Gly Leu Ala Lys Arg Val Gly Ala Arg Ile Leu Leu
130 135 140

Thr Ser Thr Ser Glu Val Tyr Gly Asp Pro Leu Glu His Pro Gln Pro
145 150 155 160

Glu Thr Tyr Trp Gly Asn Val Asn Pro Ile Gly Val Arg Ser Cys Tyr
165 170 175

Asp Glu Gly Lys Arg Val Ala Glu Thr Leu Met Phe Asp Tyr His Arg
180 185 190

Gln His Gly Ile Glu Ile Arg Val Ala Arg Ile Phe Asn Thr Tyr Gly
195 200 205

Pro Arg Met Asn Ile Asp Asp Gly Arg Val Val Ser Asn Phe Ile Ala
210 215 220

Gln Ala Leu Arg Asp Glu Ser Leu Thr Val Gln Ser Pro Gly Thr Gln
225 230 235 240

Thr Arg Ser Phe Cys Tyr Val Ser Asp Leu Val Asp Gly Leu Ile Arg
245 250 255

Leu Met Gly Gly Ser Asp Thr Gly Pro Ile Asn Leu Gly Asn Pro Gly
260 265 270

Glu Phe Thr Met Leu Glu Leu Ala Glu Thr Val Lys Glu Leu Ile Asn

275

280

285

Pro Asn Val Glu Ile Lys Ile Val Glu Asn Thr Pro Asp Asp Pro Arg
 290 295 300

Gln Arg Lys Pro Asp Ile Thr Lys Ala Gln Glu Leu Leu Gly Trp Glu
 305 310 315 320

Pro Lys Val Lys Leu Arg Asp Gly Leu Pro Leu Met Glu Gly Asp Phe
 325 330 335

Arg Leu Arg Leu Gly Ile Glu Lys Asn Asn
 340 345

<210> 3
 <211> 282
 <212> PRT
 <213> Sus scrofa

<400> 3

Met Lys Asp Pro Asp Pro Ser Gln Val Tyr Arg Pro Asp Met Asp Pro
 1 5 10 15

Glu Ala Ala Lys Asp Lys Gly Ser Phe Arg Asn Tyr Thr Ser Gly Pro
 20 25 30

Leu Leu Asp Arg Val Phe Arg Thr Tyr Lys Leu Met His Thr Trp Gln
 35 40 45

Thr Val Asp Phe Val Arg Lys Lys His Ala Gln Phe Gly Gly Phe Ser
 50 55 60

Tyr Lys Arg Met Thr Val Leu Glu Ala Val Asp Met Leu Asp Gly Leu
 65 70 75 80

Val Asp Glu Ser Asp Pro Asp Val Asp Phe Pro Asn Ser Phe His Ala
 85 90 95

Phe Gln Thr Ala Glu Gly Ile Arg Lys Ala His Pro Asp Lys Asp Trp
 100 105 110

Phe His Leu Val Gly Leu Leu His Asp Leu Gly Lys Val Leu Val Leu
 115 120 125

Ala Gly Glu Pro Gln Trp Ala Val Val Gly Asp Thr Phe Pro Val Gly
130 135 140

Cys Arg Pro Gln Ala Ser Val Val Phe Cys Asp Ser Thr Phe Gln Asp
145 150 155 160

Asn Pro Asp Leu Gln Asp Pro Val Tyr Ser Thr Glu Leu Gly Met Tyr
165 170 175

Gln Pro His Cys Gly Leu Glu Asn Ala Leu Met Ser Trp Gly His Asp
180 185 190

Glu Tyr Met Tyr Gln Met Met Lys Phe Asn Lys Phe Ser Leu Pro Gly
195 200 205

Glu Ala Phe Tyr Ile Ile Arg Phe His Ser Phe Tyr Pro Trp His Thr
210 215 220

Gly Gly Asp Tyr Arg Gln Leu Cys Asn Glu Gln Asp Leu Ala Met Leu
225 230 235 240

Pro Trp Val Gln Glu Phe Asn Lys Phe Asp Leu Tyr Thr Lys Gly Ser
245 250 255

Asp Met Pro Asp Val Asp Glu Leu Arg Pro Tyr Tyr Gln Gly Leu Ile
260 265 270

Asp Lys Tyr Cys Pro Gly Val Leu Cys Trp
275 280

<210> 4
<211> 477
<212> PRT
<213> Solanum tuberosum

<400> 4

Met Val Thr Ala Thr Thr Leu Ser Pro Ala Asp Ala Glu Lys Leu Asn
1 5 10 15

Asn Leu Lys Ser Ala Val Ala Gly Leu Asn Gln Ile Ser Glu Asn Glu
20 25 30

Lys Ser Gly Phe Ile Asn Leu Val Gly Arg Tyr Leu Ser Gly Glu Ala

35

40

45

Gln His Ile Asp Trp Ser Lys Ile Gln Thr Pro Thr Asp Glu Val Val
50 55 60

Val Pro Tyr Asp Lys Leu Ala Pro Leu Ser Glu Asp Pro Ala Glu Thr
65 70 75 80

Lys Lys Leu Leu Asp Lys Leu Val Val Leu Lys Leu Asn Gly Gly Leu
85 90 95

Gly Thr Thr Met Gly Cys Thr Gly Pro Lys Ser Val Ile Glu Val Arg
100 105 110

Asn Gly Leu Thr Phe Leu Asp Leu Ile Val Lys Gln Ile Glu Ala Leu
115 120 125

Asn Ala Lys Phe Gly Cys Ser Val Pro Leu Leu Leu Met Asn Ser Phe
130 135 140

Asn Thr His Asp Asp Thr Leu Lys Ile Val Glu Lys Tyr Ala Asn Ser
145 150 155 160

Asn Ile Asp Ile His Thr Phe Asn Gln Ser Gln Tyr Pro Arg Leu Val
165 170 175

Thr Glu Asp Phe Ala Pro Leu Pro Cys Lys Gly Asn Ser Gly Lys Asp
180 185 190

Gly Trp Tyr Pro Pro Gly His Gly Asp Val Phe Pro Ser Leu Met Asn
195 200 205

Ser Gly Lys Leu Asp Ala Leu Leu Ala Lys Gly Lys Glu Tyr Val Phe
210 215 220

Val Ala Asn Ser Asp Asn Leu Gly Ala Ile Val Asp Leu Lys Ile Leu
225 230 235 240

Asn His Leu Ile Leu Asn Lys Asn Glu Tyr Cys Met Glu Val Thr Pro
245 250 255

Lys Thr Leu Ala Asp Val Lys Gly Gly Thr Leu Ile Ser Tyr Glu Gly
260 265 270

Lys Val Gln Leu Leu Glu Ile Ala Gln Val Pro Asp Glu His Val Asn
275 280 285

Glu Phe Lys Ser Ile Glu Lys Phe Lys Ile Phe Asn Thr Asn Asn Leu
290 295 300

Trp Val Asn Leu Ser Ala Ile Lys Arg Leu Val Glu Ala Asp Ala Leu
305 310 315 320

Lys Met Glu Ile Ile Pro Asn Pro Lys Glu Val Asp Gly Val Lys Val
325 330 335

Leu Gln Leu Glu Thr Ala Ala Gly Ala Ala Ile Lys Phe Phe Asp Arg
340 345 350

Ala Ile Gly Ala Asn Val Pro Arg Ser Arg Phe Leu Pro Val Lys Ala
355 360 365

Thr Ser Asp Leu Leu Leu Val Gln Ser Asp Leu Tyr Thr Leu Thr Asp
370 375 380

Glu Gly Tyr Val Ile Arg Asn Pro Ala Arg Ser Asn Pro Ser Asn Pro
385 390 395 400

Ser Ile Glu Leu Gly Pro Glu Phe Lys Lys Val Ala Asn Phe Leu Gly
405 410 415

Arg Phe Lys Ser Ile Pro Ser Ile Ile Asp Leu Asp Ser Leu Lys Val
420 425 430

Thr Gly Asp Val Trp Phe Gly Ser Gly Val Thr Leu Lys Gly Lys Val
435 440 445

Thr Val Ala Ala Lys Ser Gly Val Lys Leu Glu Ile Pro Asp Gly Ala
450 455 460

Val Ile Ala Asn Lys Asp Ile Asn Gly Pro Glu Asp Ile
465 470 475